Claims

1. An anode material for lithium ion secondary battery comprising a coated graphite powder coated with a carbonized material of thermoplastic resin as a raw material, wherein the coated graphite powder satisfies the following two characteristics (1) and (2):

(1) a mesopore volume defined by IUPAC is 0.01cc/g or less as calculated with the BJH method as viewed from desorption isotherm; and

(2) an average particle size as measured by a laser-scattering-particle-size-distribution measuring device ranges from 10 μm to 50 μm, and a ratio of standard deviation to the average particle size (σ/D) is 0.02 or less.

2. The anode material for lithium ion secondary battery according to Claim 1, wherein the coated graphite powder has a peak strength ratio R of 1,360cm^{-1} to 1,580cm^{-1} ($R=I_{1360}/I_{1580}$) of 0.4 or less as determined by a raman spectrum analysis using a wavelength of 532nm.

3. The anode material for lithium ion secondary battery according to Claim 1, wherein a rate of oxidation loss of the coated graphite powder when oxidized in atmospheres of 400℃ and an air mass flow of 3l/min. for one hour is 2wt% or more.

4. The anode material for lithium ion secondary battery according to Claim 1, wherein the coated graphite powder has a specific surface area in the range of 0.5m^2/g to 4m^2/g as calculated based on BET using nitrogen atom as absorptive.

5. The anode material for lithium ion secondary battery according to

Claim 1, wherein the coated graphite powder has an H/C value of 0.01 or less as determined by an elemental analysis.

6. The anode material for lithium ion secondary battery according to Claim 1, wherein the coated graphite powder is mixture of two different kinds of coated graphite powders different in average particle size from each other.

7. The anode material for lithium ion secondary battery according to Claim 6, wherein the mixture is mixed powders of graphite powder having an average particle size ranging from 15 μ m to 25 μ m and graphite powder having an average particle size ranging from 8 μ m to 15 μ m, and a mixing rate of the graphite powders is 50-90wt%/50-10wt% as expressed in terms of average particle size of 15-25 μ m/average particle size of 8-15 μ m.

8. The anode material for lithium ion secondary battery according to Claim 1, wherein the graphite powder has an average interlayer spacing d_{002} of not more than 0.3380nm and L(112) of not less than 5nm as determined by the Gakushin-method for X-ray diffraction of carbon using an X-ray diffraction device.

9. The anode material for lithium ion secondary battery according to Claim 1, wherein an accumulative pore volume of the coated graphite powder increases 5% or more, as compared with an accumulative pore volume of the graphite powder having a pore size of 0.012 μ m to 40 μ m as measured by a mercury porosimeter method.

10. The anode material for lithium ion secondary battery according to Claim 1, wherein the mesopore volume of the coated graphite powder is 60% or less of the mesopore volume of the graphite powder.

11. The anode material for lithium ion secondary battery according to Claim 1, wherein the coated graphite powder is coated with carbonized material of thermoplastic resin of a carbonization yield of not more than 20wt% in a proportion of not more than 10 parts by weight the carbonized material per 100 parts by weight graphite powder.

12. The anode material for lithium ion secondary battery according to Claim 1, wherein the thermoplastic resin is any one of polyvinyl chloride, polyvinyl alcohol and polyvinyl pyrrolidone, or mixture thereof.